



MARCH OF DIMES

WHITE PAPER ON PRETERM BIRTH

T H E

G L O B A L

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R E G I O N A L

T O L L

BASED ON DATA FROM THE
WORLD HEALTH ORGANIZATION



MARCH OF DIMES

WHITE PAPER ON PRETERM BIRTH

THE GLOBAL AND REGIONAL TOLL

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SUPPORTING ORGANIZATIONS

March of Dimes

President Franklin Roosevelt established the National Foundation for Infantile Paralysis (now known as the March of Dimes Foundation) in 1938 to defeat polio. He created a partnership of volunteers and researchers that led to the development of the polio vaccines. Today the March of Dimes mission is to improve the health of babies by preventing birth defects, premature birth and infant mortality. The March of Dimes funds basic and clinical research worldwide and supports services that help women and infants receive medical care and social services. For more information, visit <http://marchofdimes.com>.

In 1998, the March of Dimes broadened its mission beyond the United States by establishing its office of Global Programs. Global Programs conducts its work through mission alliances—close technical partnerships with academic centers and other private and public organizations in developing countries—to reduce mortality and disability from birth defects and preterm birth and improve perinatal health. In the past 11 years, March of Dimes has helped implement effective, affordable and feasible programs in 34 countries on four continents.

World Health Organization, Department of Reproductive Health and Research

The mission of the World Health Organization (WHO) Department of Reproductive Health and Research (RHR) is to help people to lead healthy sexual and reproductive lives. In pursuit of this mission the Department endeavors to strengthen the capacity of countries to enable people to promote and protect their own sexual and reproductive health and that of their partners, and to have access to, and receive, high-quality sexual and reproductive health services when needed. RHR was established

in November 1998 by bringing together the UNDP/UNPF/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction (HRP) and the former WHO Division of Reproductive Health (Technical Support) (RHT). The purpose of joining these two entities was to facilitate integration of research and program development in sexual and reproductive health within the WHO. For more information, visit <http://www.who.int/fch/depts/rhr/en>.

Save the Children, USA

Save the Children is the leading, independent organization creating lasting change for children in need in the United States and around the world. For more than 75 years, Save the Children has worked to improve the lives of children and their families through programs in health, education and economic opportunities, and during times of crisis and conflict. Save the Children USA is a member of the International Save the Children Alliance, a global network of 27 independent Save the Children organizations working to ensure the well-being and protection of children in more than 120 countries. For more information, visit <http://www.savethechildren.org>.

Save the Children's Saving Newborn Lives (SNL) program, supported by the Bill & Melinda Gates Foundation, works to strengthen data and evidence for newborn health and scale up effective newborn care, particularly in 18 selected countries which together account for two-thirds of the world's 3.82 million neonatal deaths. Many of the leading research publications on newborn health in low income settings over the last decade have been funded or co-funded by SNL, such as The Lancet Neonatal Series in 2005, and a number of innovative community-based trials including the winner of The Lancet Paper of the year award in 2008.

Partnership for Maternal, Newborn, and Child Health

The Partnership for Maternal, Newborn, and Child Health (PMNCH) is a global health partnership launched in September 2005. The PMNCH joins the maternal, newborn and child health communities into an alliance of almost 260 members from all over the world to ensure that all women, infants and children not only remain healthy, but thrive. The PMNCH secretariat is hosted and administered by the World Health Organization in Geneva. For more information, visit <http://www.who.int/pmnch/en>.

KEY MESSAGES FROM WHITE PAPER

- ❖ The global toll of preterm birth is severe.
 - An estimated 28 percent of the 4 million annual neonatal deaths are due to preterm birth.
 - Approximately 12.9 million babies are born too soon every year, a global prevalence of preterm birth of 9.6 percent.
- ❖ The regional toll of preterm birth is particularly heavy for Africa and Asia where over 85 percent of all preterm births occur.
- ❖ The highest rate of preterm birth by UN region according to the data available is in Africa; followed by (in descending order) North America (Canada and the United States combined); Asia; Latin America and the Caribbean; Oceania (Australia and New Zealand); and Europe.
- ❖ Wherever trend data are available, rates of preterm birth are increasing. For example, the rate of preterm birth in the United States has increased 36 percent in the past 25 years. The increase in the rate of late preterm births (between 34 and 36 weeks gestation) accounts for most of the increase. Whether the rate of preterm birth is also increasing in low- and middle-income countries remains unknown.
- ❖ There are huge gaps in data on preterm birth prevalence, mortality, acute morbidity and long-term impairment in certain regions and countries such as Africa, Central Asia and China. However, all countries, including rich nations, need to strengthen their data collection systems.
- ❖ Strategies for reducing death and disability related to preterm birth must be given priority, particularly if the world is to achieve Millennium Development Goal (MDG) 4 for child survival. Many of these same strategies will also contribute to MDG-5, the improvement of women's health.

INTRODUCTION

Wherever available, evidence suggests that the rate of preterm birth in high-income countries is rising. By contrast, maternal and infant health experts do not yet have a complete understanding of how widespread the problem is in low- and middle-income countries (LMICs). There are huge gaps in data collection and each country has its own unique set of challenges that must be addressed in order to improve birth outcomes and reach the United Nation's Millennium Development Goals 4 (reduce child mortality) and 5 (improve maternal health) by 2015.

This White Paper presents newly-published data on the global and regional toll of preterm birth provided by the Department of Reproductive Health and Research of the World Health Organization (RHR/WHO) as a first step in measuring the extent of preterm birth worldwide. March of Dimes and RHR/WHO expect that these data will serve as a catalyst for policy makers, researchers, donors, clinicians and the general public to address this major public health problem. A future report will provide country-specific rates and suggest strategies to reduce mortality and disability from preterm birth.

The March of Dimes is proud to work with RHR/WHO and our co-editors from Saving Newborn Lives/Save the Children USA and the Partnership for Maternal, Newborn, and Child Health in releasing this first look at the worldwide scope of the problem of preterm birth.

PRETERM BIRTHS: WHY DON'T THEY COUNT?

Preterm birth, defined as delivery prior to 37 completed weeks or 259 days gestation (see Box 1), is a major challenge for maternal and perinatal care worldwide and a leading cause of neonatal morbidity and mortality (WHO, 2005a). Children born prematurely have higher rates of learning disabilities,

cerebral palsy, sensory deficits and respiratory illnesses compared to children born at term (IOM, 2007). These negative health and developmental effects of preterm birth often extend to later life, resulting in enormous medical, educational, psychological and social costs. These costs and the significant number of neonatal deaths attributable to preterm birth—an estimated 28 percent of the 4 million annual neonatal deaths are due to preterm birth (Lawn et al., 2005, 2006b)—indicate an urgent need for greater international attention.

Until recently, there was little recognition of preterm birth as a worldwide problem, and this has impeded the development of policies and programs appropriate for implementation in LMICs. The relative neglect of preterm birth is linked to data gaps on the global toll of prematurity, including the extent of associated death and disability. The new estimates shown in this report make a substantial contribution to addressing this deficiency. Widely held perceptions that effective care of the preterm baby requires costly interventions well beyond the health budgets of most LMICs, coupled with concerns that greater attention to preterm birth will draw needed funding away from other devastating maternal and perinatal health problems, have also contributed to the reluctance of policy makers to make the problem of preterm delivery a global priority.

Following the call-to-action presented in the 2005 World Health Report, *Make Every Mother and Child Count*, and the Lancet Neonatal Survival Series, neonatal health in general and preterm birth in particular are finally emerging as priority issues on the global health agenda (WHO, 2005a; Lawn et al., 2006a). The continuum of care approach premised upon the interconnectedness of maternal and newborn health has been widely adopted in public health and in global initiatives, including the *Countdown to 2015*; as a result, political commitment to

maternal and newborn survival has increased (Bryce and Requejo, 2008). A Lancet series dedicated to preterm birth in high-income countries was launched in early 2008 (WHO, 2005b) and a major international conference on prematurity and stillbirths to facilitate the development of a global plan of action to address research gaps on these two topics was held in May 2009 (Global Alliance to Prevent Prematurity and Stillbirths—GAPPS) (GAPPS, 2009). These developments are all encouraging signs that our knowledge of preterm birth and ability to reduce associated mortality and disability will improve in the near future.

The growing concentration of child mortality in the neonatal period (38 percent of all deaths in children under 5 years of age in 2000 were concentrated in the neonatal period), the high percentage of neonatal deaths attributed to preterm birth worldwide (28 percent), and reports of increasing rates of preterm birth in the past decade are all indications that the achievement of MDG-4 will require concentrated attention on preterm birth. A greater focus

on preterm birth will also benefit maternal health, contributing to global efforts to accelerate progress towards MDG-5. Given the proximity of 2015 and the evidence that MDG-4 and MDG-5 are off track, the time is now for the international community to step up and dedicate greater resources to preterm birth (Bryce and Requejo, 2008).

RAISING GREATER AWARENESS OF PRETERM BIRTH: THE MARCH OF DIMES AND WORLD HEALTH ORGANIZATION JOIN TOGETHER

There is a paucity of data on preterm birth prevalence and mortality and almost complete absence of data on acute morbidity and long-term impairment associated with prematurity in LMICs and many high-income countries. Reasons for this include constrained diagnostic capability, poor health-related statistics and information systems, lack of preterm birth surveillance registries or poor coordination among existing registries and reliance on hospital-based rather than population-based studies (Mahapatra et al., 2007).

Having encountered this same lack of data on birth defects in the early 2000s and in response to a growing number of requests at that time from researchers, health care providers and parent/patient organizations in developing countries for information on the toll of common birth defects in their countries, the March of Dimes in 2006 published its *Global Report on Birth Defects: The Hidden Toll of Dying and Disabled Children* (Christianson et al., 2006). The report, with its systematic comparison of the numbers and rates of annual births of infants with specific serious birth defects in 193 countries, brought international attention to the serious and vastly unappreciated public health problem of birth

box 1

Categories of Preterm Birth

Preterm (or premature) infant

Infant born before 37 completed weeks of gestation

Late preterm infant (a recently identified category)

Infant born between 34 and 36 weeks gestation

Moderately preterm infant

Infant born between 32 and 36 completed weeks of gestation

Very preterm infant

Infant born before 32 completed weeks of gestation

SOURCE: Iams and Creasy, 2004; Davidoff et al., 2006

defects. It also provided governmental and non-governmental policy makers, funding organizations and health care providers with feasible, cost-effective recommendations for reducing the toll in LMICs.

In discussions in 2008, March of Dimes and RHR/WHO recognized the need for a similar report to help document the high toll of preterm birth worldwide and offer recommendations for research and intervention that could help reduce this toll, particularly in LMICs. RHR/WHO, working with the Child Health Epidemiology Reference Group, took the lead in generating the updated global, regional and country-specific preterm birth estimates essential for documenting the toll and for providing governments and the international community the means to establish health priorities. March of Dimes agreed to oversee preparation and production of the report in consultation with RHR/WHO. It also engaged as co-editors of the report, Dr. Joy Lawn of Saving Newborn Lives/Save the Children USA, and Dr. Jennifer Requejo of the Partnership for Maternal, Newborn, and Child Health and Johns Hopkins Bloomberg School of Public Health, USA. Their work with RHR/WHO in generating the preterm birth estimates and their technical expertise and understanding based on many years of experience working to strengthen maternal, neonatal and child

health services in lower-resource countries have been invaluable to this process.

Originally, March of Dimes and RHR/WHO planned to issue a single report with preterm birth estimates at the global, regional and country levels. Because of the complexity in generating the country-level data and the current availability of the global and regional estimates, March of Dimes and RHR/WHO agreed to a two-stage process, with the publication of the global and regional estimates in this White Paper being the first step. A second document containing country-level estimates from RHR/WHO (described below) will be published in 2010.

THE GLOBAL AND REGIONAL TOLL OF PRETERM BIRTH

This section presents new estimates of the global prevalence of preterm birth and on birth prevalence by UN region and by level of economic development, as well as trend data wherever available.

As Table 1 indicates, approximately 12.9 million babies worldwide are born too early every year, representing a prevalence of preterm birth of 9.6 percent. Also, the global distribution of these births is uneven.

Estimated preterm birth rates by national income category and UN region

table 1

Region	Preterm births (x1000)	Preterm birth rate (%)	95% confidence intervals
High resource regions	1,014	7.5	7.3 - 7.8
Middle resource regions	7,685	8.8	8.1 - 9.4
Low resource regions	4,171	12.5	11.7 - 13.3
Africa	4,047	11.9	11.1 - 12.6
Asia	6,907	9.1	8.3 - 9.8
Europe	466	6.2	5.8 - 6.7
Latin America & the Caribbean	933	8.1	7.5 - 8.8
North America *	480	10.6	10.5 - 10.6
Oceania (Australia / New Zealand)	20	6.4	6.3 - 6.6
World Total	12,870	9.6	9.1 - 10.1

SOURCE: Beck et al., 2009.

* See Hamilton et al., 2007 and PHAC, 2008

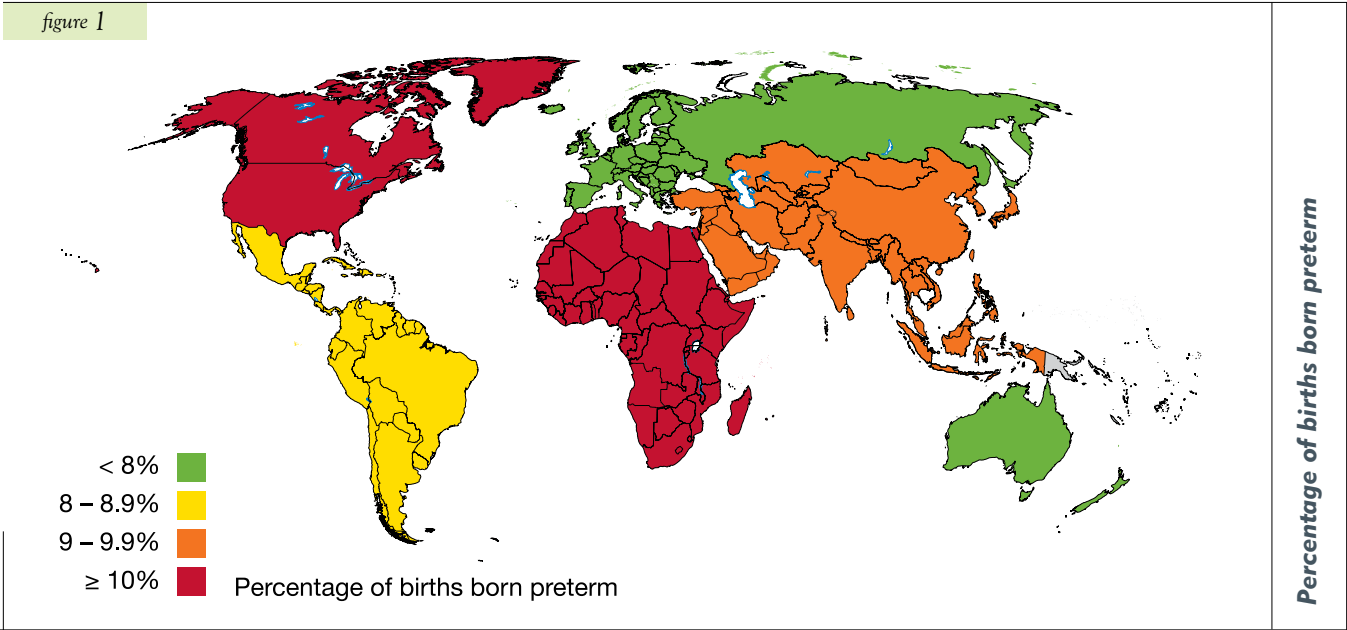
With respect to absolute number of preterm births, 85 percent occur in Africa and Asia where almost 11 million births are estimated as preterm per year. In contrast, 900,000 babies are born premature in Latin America and the Caribbean, and about 500,000 preterm births occur in both Europe and North America (Canada and the United States combined) on an annual basis.¹ The high absolute number of preterm births in Africa and Asia is associated with the substantially greater number of deliveries and fertility levels in these two regions in comparison to other parts of the world.

When considering the rate of preterm birth, the highest rate by UN region is found in Africa where 11.9 percent of births are preterm. The WHO data show a rate in North America of 10.6 percent. The U.S. National Center for Health Statistics reports that the preterm birth rate in the U.S. is 12.7 percent (Hamilton et al., 2007) and the Canadian government reports a rate of 8.2 percent (PHAC, 2008). The lowest rates are in Australia/New Zealand and in Europe, where they are 6.4 and 6.2, respectively.

Rates by regional level of development are highest for low resource regions (12.5 percent), moderate for middle resource regions (8.8 percent) and lowest for high resource regions (7.5 percent).

The 95% confidence intervals in Table 1 are illustrative of another fact underlying this report—that there are huge gaps in data on preterm birth prevalence for many regions of the world. Although the gaps are particularly great for Africa, Central Asia and China, there are also gaps in data from high-income countries. Not surprising, data on preterm birth-associated mortality are lacking as well. Even worse, there are almost no data currently on acute morbidities or long-term impairment associated with prematurity, thus preventing even the most basic assessments of service needs.

The following figures present the information in Table 1 in another way—graphically on a world map. Figures 1 and 2 depict preterm birth rates and the absolute numbers of preterm birth, respectively, by region.



SOURCE: Beck et al., 2009.

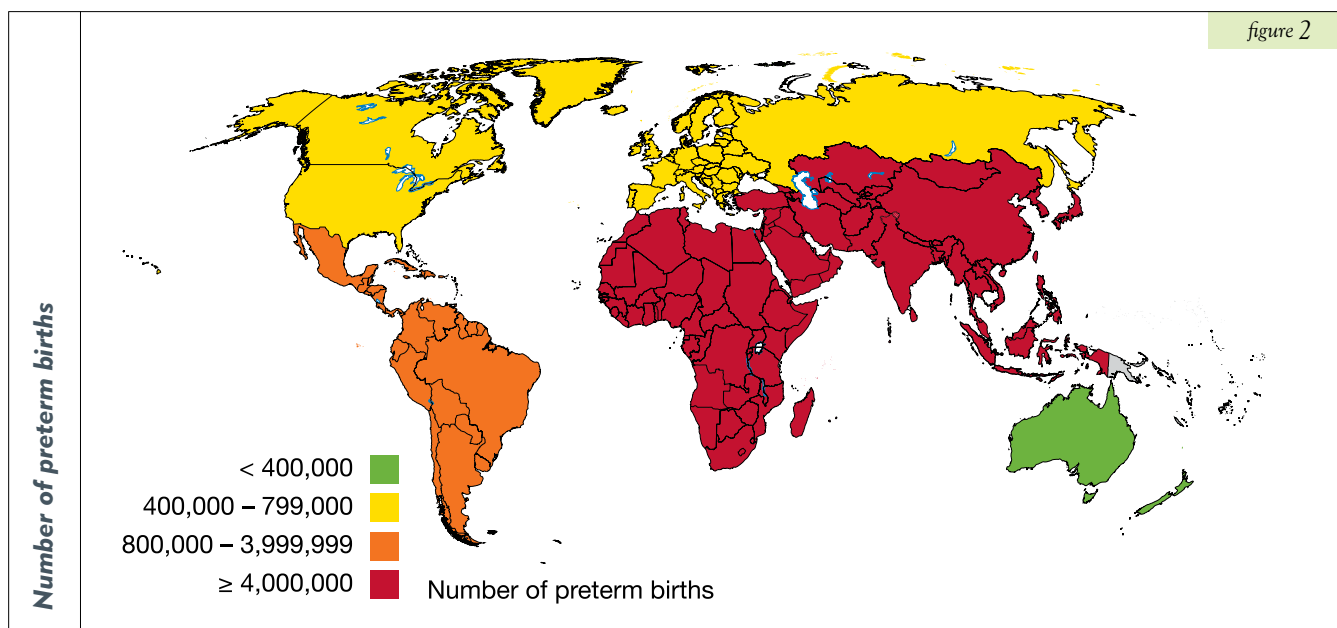
¹ The difference between the numbers of preterm birth reported by the WHO Bulletin and those by the NCHS are attributable to the populations measured. The WHO Bulletin estimates are restricted to preterm births in singleton pregnancies only, whereas the NCHS estimates include all pregnancies. For this and other reasons, the editors believe that the WHO Bulletin figures in this white paper are conservative and likely underestimate the true magnitude of preterm birth. It is expected that the new estimates will increase as more complete and accurate data are collected. For more about the methods used to derive the WHO Bulletin estimates, consult Beck et al., 2009, and Gülmezoglu et al., 2004.

Time Trends in Preterm Birth Rates

Wherever quality trend data are available (mostly in high-income countries), rates of preterm birth appear to be increasing—e.g., the United States, Denmark and Norway (Joseph et al., 2007; Langhoff-Roos et al., 2006; Martin et al., 2009; Thompson et al., 2006). For example, the rate of preterm birth (less than 37 completed weeks gestation) in the United States has increased 36 percent in the past 25 years. The majority of this increase as can be seen in Figure 3 is due to a rise in the rate of late preterm births (between 34 and 36 weeks gestation). Factors contributing to the upward trend in the United States include—but are not limited to—greater usage of assisted reproductive techniques which increase the rates of multiple gestations; a rise in the proportion of births to women over 35 years of age; and changes in clinical practice such as the early induction of labor or performance of Cesarean sections close to, but not at, full term (IOM, 2007). Whether rates of preterm birth are also increasing in LMICs and other high-income countries where data are limited remains unknown.

The aggregate U.S. trend masks significant racial and ethnic disparities in preterm birth rates. For example, non-Hispanic black infants are more than 1.5 times as likely to be born preterm than non-Hispanic white infants, and this disparity in preterm birth accounts for a large proportion of the gap in black-white infant mortality levels observed for the United States (Anachebe and Sutton, 2003; Ahern et al., 2003; MacDorman and Mathews, 2008).

In summary, the data in the White Paper paint a grim picture. The high numbers of preterm birth worldwide, the disproportionate toll of preterm births in developing countries, the high rates of preterm birth in Africa and North America, the increasing rates of preterm birth observed wherever data are available and the major data gaps on preterm birth prevalence, mortality, acute morbidity and long-term impairment worldwide are all indications that preterm birth is a global problem that needs greater attention by policy makers, researchers, health care providers, the media, donor organizations and other stakeholders. The marked disparities in preterm birth along racial/ethnic lines in many high-income countries and the concentration of preterm births in



SOURCE: Beck et al., 2009.

Africa and Asia also clearly indicate that addressing preterm birth is essential for reducing the pronounced inequities in neonatal health and for the world to achieve MDG-4 (Lawn et al., 2005).

FORTHCOMING GLOBAL REPORT ON PRETERM BIRTH FROM THE MARCH OF DIMES AND WORLD HEALTH ORGANIZATION

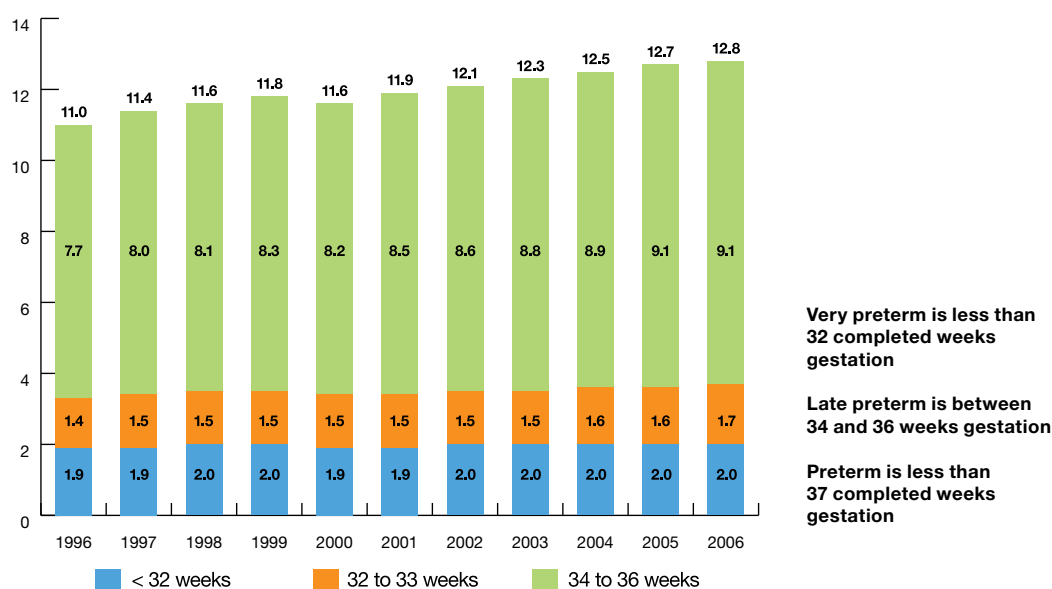
The publication of the global and regional estimates in this White Paper is an important first step in providing needed data on the toll of preterm birth worldwide. However, both March of Dimes and RHR/WHO recognize the critical need to publish estimates at the country level to address current serious data gaps. The forthcoming March of Dimes Global Report on Preterm Birth, to be published in 2010, will provide these data. In addition, the report will examine opportunities for prevention, care of the

high-risk mother and preterm infant, detection and treatment of disabilities associated with prematurity, improved data collection and analysis, use of existing networks for quicker and more cost-effective implementation of programs and strengthening parent/patient and other lay support organizations. The report will also offer recommendations for research. It will be accompanied by a color-coded stand-alone wall chart summarizing key findings and depicting the global distribution of preterm birth by country.

REDUCING MORTALITY AND DISABILITY FROM PRETERM BIRTH: IMMEDIATE ACTIONS

Although many of the causal pathways resulting in preterm labor remain obscure—thus severely limiting opportunities for primary and secondary prevention even in high-income countries²—much, in fact, can be done to assess and improve the care of

figure 3



SOURCE: March of Dimes Perinatal Data Center, 2009.

For more information, visit PeriStats at <http://www.marchofdimes.com/peristats>

² Interventions to reduce mortality and disability associated with preterm birth can be classified as primary (directed to all women before or during pregnancy to prevent or reduce risk), secondary (directed to eliminating or reducing risk in women with known risk factors) and tertiary (initiated after the parturition period has started, with the goal of preventing premature delivery or improving outcomes for preterm infants). (Iams et al., 2008).

women with a high-risk pregnancy and of the preterm baby even in resource-constrained settings. To be most effective, such strategies should involve strengthening existing reproductive, maternal, newborn and child health (RMNCH) care programs to encourage synergies of preterm birth care while, at the same time, stimulating fresh thinking and innovative new approaches.

The forthcoming global report will describe these strategies in depth. However, because preterm birth is a large and increasingly pressing problem adversely affecting individuals, families, societies and health care systems, urgent interventions are needed now. The editors, therefore, call for the following immediate actions.

1. Visibility: This White Paper and all available documents should be used to inform health professionals, policy makers, the news media, women of childbearing age, and other stakeholders about the worldwide toll of preterm birth and the opportunities for care of the high-risk mother and preterm infant.

2. Definitions: An internationally acceptable classification of preterm birth, standardized glossary of terms and harmonized methods of data collection and analysis need to be developed for data collection efforts to be maximally effective.

3. Data Collection: The collection of data on preterm birth must be strengthened in high-prevalence regions and countries, particularly where there are large data gaps such as in Africa, China and Central Asia. To promote this end, increased funding should be directed toward strengthening clinical training to improve the ability to diagnose and record a preterm birth in the hospital or clinic setting, promote greater use of verbal autopsies and other means of capturing data on preterm birth prevalence and mortality outside the hospital or clinic

setting and improve assessment of gestational age. Special attention should also be directed to capturing data on acute morbidities and long-term impairment associated with prematurity.

4. Program Action: Even in the absence of effective strategies to prevent preterm births, there should be continued emphasis on the provision of basic public health measures that can help decrease preterm birth-associated mortality and disability in the mother and newborn, and particularly on improved care of preterm babies. These measures should be implemented and coordinated within existing RMNCH systems to encourage synergies of preterm birth care while, at the same time, stimulating creative new approaches.

5. Investment: Finally, advocacy is needed to convince donor organizations of the importance of investing in existing program and research networks in LMICs to improve the quality and cost-effectiveness of available programs. Such efforts should include the strengthening of patient/parent support groups and advocacy for increased funding for research on the causes of preterm birth.

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EDITORS

Christopher P. Howson

Global Programs, March of Dimes Foundation, White Plains, New York 10605,
USA, email: chowson@marchofdimes.com

Mario Meriardi

Reproductive Health and Research, World Health Organization, 20, avenue Appia, CH-1211, Geneva 27,
Switzerland, email: merialdim@who.int

Joy E. Lawn

Saving Newborn Lives/Save the Children USA, 11 South Way, Cape Town 7405,
South Africa, email: joylawn@yahoo.co.uk

Jennifer H. Requejo

Partnership for Maternal, Newborn, and Child Health, 20, avenue Appia, CH-1211, Geneva 27,
Switzerland, email: jrequijo@earthlink.net

Lale Say

Reproductive Health and Research, World Health Organization, 20, avenue Appia, CH-1211, Geneva 27,
Switzerland, email: sayl@who.int





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globalprograms@marchofdimes.com

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